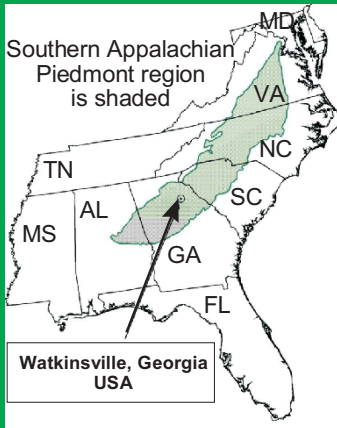




Agricultural Research Service



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National Program

JPC Research Note-05A

Integrated Agriculture Pasture-Crop Rotation

Why does it matter?

Integration of crops and livestock could provide benefits to both crop and livestock production systems, by enhancing economic diversity and opportunities and preserving environmental quality.

Accumulation of soil organic matter following long-term perennial pastures should be preserved to maintain soil quality for following annual crops.

Cropping system concerns

Erosion
Low soil organic matter

Animal grazing system concerns

Low forage quality
Internal parasites

↑ Agricultural productivity
↑ Environmental quality
↑ Economic diversity



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What was done?

Old pastures were converted to two different cropping systems

- (1) wheat grain + pearl millet cover
- (2) sorghum or corn + rye cover

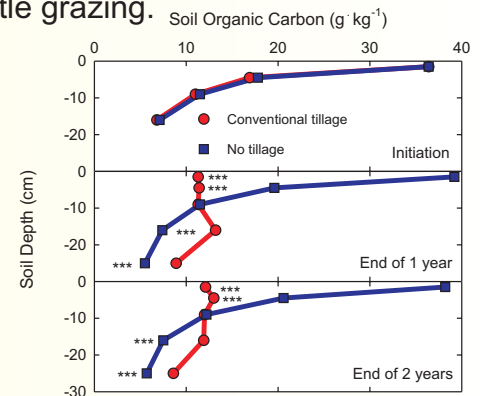
Cover crops were either grazed or unused to build surface residue

Systems were managed with (CT) conventional tillage or (NT) no tillage

What was found?

During the first 2 years, sorghum and wheat grain production were similar, irrespective of tillage and cover crop management. Allowing cattle to graze high-quality cover crops added value to the agricultural enterprise. No tillage produced more vigorous cover crops, which led to greater animal gain. Soil properties were preserved under NT and were not negatively affected by cattle grazing.

Crop component	--- Cover Crop ---	
	Ungrazed	Grazed
Rye stover (Mg/ha)	7.4	> 0.6
Sorghum grain (Mg/ha)	2.3	> 2.2
Millet stover (Mg/ha)	10.7	> 1.0
Wheat grain (Mg/ha)	2.1	< 2.5
Crop / animal component	--- Tillage ---	
	CT	NT
Rye stover (Mg/ha)	7.0	7.9
Animal gain (kg/ha)	294	< 485
Millet stover (Mg/ha)	8.9	< 12.5
Animal gain (kg/ha)	404	433



Further description of this research in:

- (1) Franzluebbbers AJ, Stuedemann JA. 2004. Crop and animal production in yearly rotations with inversion and no tillage. Proc. 26th Annual Conservation Tillage Conference, Raleigh NC.
- (2) Franzluebbbers AJ, Stuedemann JA. 2005. Soil responses under integrated crop and livestock production. Proc. 27th Annual Conservation Tillage Conference, Florence SC.

What's the impact?

Agricultural productivity can be enhanced with integration of crop and livestock operations, and more so with no tillage, which also preserves soil quality.